INDEX TO VOLUME 23—1981

Index to Authors and Contributors

AL-DAINI, A. J. *Paper* Prediction of stall type (abrupt or progressive) for a single compressor rotor, 273

BACKHOUSE, C. *Paper* Analogue computer simulation of a robot-manipulator, 121
BAI, Y. L. *Papers* The effects of projectile speed and medium resistance in richochet off sand, 69; An estimate of the effect of back spin on the critical angle in the unyawed ricochet of a cylinder, 201
BIRON, A. *Paper* An interaction effect consideration in cumulative damage in metals due to creep, 281
BISHOP, R. E. D. *Paper* On the use of equilibrium axes and body axes in the dynamics of a rigid ship, 243
BOSMAN, C. *Paper* Analytical theory of three dimensional flow in centrifugal compressors, 179
BUI-QUOC, T. *Paper* An interaction effect consideration in cumulative damage in metals due to creep, 281
BURDESS, J. S. *Paper* A theoretical and experimental evaluation of the multigimbal Hooke's joint gyroscope, 193

CHANDRA, M. *Paper* Analysis of a centrally loaded 120 degree partial porous journal bearing taking tangential velocity slip into account, 171
CHISHOLM, D. *Research notes* Flow of compressible two-phase mixtures through sharp-edged orifices, 45; Mass velocities under choked flow conditions in two-phase flashing pipe flow, 309
CRANFIELD, R. R. *Paper* Drain discharge characteristics of horizontal drums, 77

DATTA, P. K. *Research note* An analogue simulation of the non-linear vibration of a plate with a central opening subjected to tension loading, 103
DAWSON, P. H. *Paper* The effect of sliding on rolling contact pitting, 289
DOWSON, D. *Papers* A theoretical analysis of the twin-land type of oil-control piston ring, 51; The prediction of gas pressure within the ring packs of large bore diesel engines, 295
DUKKIPATTI, R. V. *Paper* Velocity fluctuations in spatial four-link mechanisms, 143

ECONOMOU, P. N. *Paper* A theoretical analysis of the twin-land type of oil-control piston ring, 51; The prediction of gas pressures within the ring packs of large bore diesel engines, 295
EDMUNDS, A. J. *Paper* Bending of long steel and aluminium rods during end impact with a rigid target, 85
ELGAMMEL, A. H. *Paper* A method for predicting annular diffuser performance with swirling inlet flow, 107
ELKERSH, A. M. *Paper* A method for predicting annular diffuser performance with swirling inlet flow, 107

FISHER, E. H. *Paper* A study of diffuser/rotor interaction in a centrifugal compressor, 149
FOK, W. C. *Paper* Modified pivotal plot for critical load calculation of a rectangular plate under edge compression, 167
FOX, C. H. J. *Paper* A theoretical and experimental evaluation of the multi-gimbal Hooke's joint gyroscope, 193

GARDINER, T. *Paper* Cyclic softening and over-softening of a 1 per cent Cr–Mo–V steel at elevated temperatures, 305
GOHAR, R. *Paper* Porous retainers for rolling bearings, 263

HORNE, M. R. *Paper* The behaviour of circular tubes with large openings subjected to axial compression, 225

INOUE, M. *Paper* A study of diffuser/rotor interaction in a centrifugal compressor, 149

JOHNSON, W. *Papers* The effect of projectile speed and medium resistance in ricochet off sand, 69; Bending of long steel and aluminium rods during end impact with a rigid target, 85; An estimate of the effect of backspin on the critical angle in the unyawed ricochet of a cylinder, 201

LEWIS, R. I. *Papers* Surface vorticity modelling of separated flows from two-dimensional bluff bodies of arbitrary shape, 1; Simulation of viscous diffusion for extension of the surface velocity method to boundary layer and separated flows, 157

MALIK, M. *Paper* Analysis of a centrally loaded 120 degree partial porous journal bearing taking tangential velocity slip into account, 171
MALIK, M. *Paper* The rolling-pad journal bearing: a promising anti-whirl configuration, 131
McGEOUGH, J. A. *Paper* Theoretical analysis of the electroforming process, 113
MONTAGUE, P. *Paper* The behaviour of circular tubes with large openings subjected to axial compression, 225

O'CARROLL, M. J. *Paper* Dynamic performance of hydraulic buffers of unequal rating in series, 221
ORGAN, A. J. *Paper* Gas dynamics in the temperature-determined Stirling cycle, 207
OSMAN, M. O. M. *Paper* Velocity fluctuations in spatial four-link mechanisms, 143
PORTHOUSE, D. T. C. *Paper* Simulation of viscous diffusion for extension of the surface velocity method to boundary layer and separated flows, 157
PRICE, W. G. *Paper* On the use of equilibrium axes in the dynamics of a rigid ship, 243

RASMUSSEN, H. *Paper* Theoretical analysis of the electroforming process, 113
REES-JONES, J. *Paper* Analogue computer simulation of a robot-manipulator, 121
REID, S. R. *Paper* Bending of long steel and aluminium rods during end impact with a rigid target, 85
RIMROTT, F. P. J. *Paper* Energy dissipation in gyromechanics through the concept of intervalwise rigidity, 93
RUDDY, B. L., *Paper* A theoretical analysis of the twin-land type of oil-control piston ring, 51; The prediction of gas pressures within the ring packs of large bore diesel engines, 295

SAFAR, Z. S. *Paper* Analysis of hydrodynamic thrust bearing operated under unsymmetrical conditions, 31
SINGH, C. *Paper* Dynamic loading of micropolar fluid lubricated short journal bearings, 37
SINGH, D. V. *Papers* Analysis of hydrodynamic journal bearings having non-Newtonian lubricants (Prandtl model) by a finite element method, 63; The rolling pad journal bearing: a promising anti-whirl configuration, 131
SINHA, P. *Paper* Dynamic loading of micropolar fluid lubricated short journal bearings, 37
SINHASAN, R. *Papers* Analysis of hydrodynamic journal bearings having non-Newtonian lubricants (Prandtl model) by a finite element method, 63; The rolling pad journal bearing: a promising anti-whirl configuration, 131; Analysis of a centrally loaded 120 degree partial porous journal bearing taking tangential velocity slip into account, 171
SO, H. *Paper* Porous retainers for rolling bearings, 263

TAYAL, S. P. *Paper* Analysis of hydrodynamic journal bearings having non-Newtonian lubricants (Prandtl model) by a finite element method, 63
TURNBULL, S. R. *Paper* Design of planetary cams for short period events, 13
TURVEY, G. J. *Paper* Large deflection cylindrical bending analysis of cross-ply laminated strips, 21

VAN DE VEGTE, J. *Paper* Balancing of flexible rotors during operation, 257

WANG, C. Y. *Paper* Unfolding a curved elastic sheet, 217

YUEN, M. F. *Paper* Modified pivotal plot for critical load calculations of a rectangular plate under edge compression, 167

Subject Index

ANALOGUE COMPUTER SIMULATION OF A ROBOT-MANIPULATOR, *Paper*, 121
ANALOGUE SIMULATION OF THE NONLINEAR VIBRATION OF A PLATE WITH A CENTRAL OPENING SUBJECTED TO TENSION LOADING, *Research note*, 103
ANALYSIS OF A CENTRALLY LOADED 120 DEGREE PARTIAL POROUS JOURNAL BEARING TAKING TANGENTIAL VELOCITY SLIP INTO ACCOUNT, *Paper*, 171
ANALYSIS OF HYDRODYNAMIC JOURNAL BEARINGS HAVING NON-NEWTONIAN LUBRICANTS (PRANDTL MODEL) BY A FINITE ELEMENT METHOD, *Paper*, 63
ANALYSIS OF A HYDRODYNAMIC THRUST BEARING OPERATED UNDER UNSYMMETRICAL CONDITIONS, *Paper*, 31
ANALYTICAL THEORY OF THREE DIMENSIONAL FLOW IN CENTRIFUGAL COMPRESSORS, *Paper*, 179
Annular diffuser performance with swirling inlet flow, 107
Axes, body, in the dynamics of a rigid ship, 243, 244, 249
Axes, equilibrium, in the dynamics of a rigid ship, 243, 246–9
Axial compression applied to circular tubes, 225

BALANCING OF FLEXIBLE ROTORS DURING OPERATION, *Paper*, 257
Bearing, journal, analysis of partial porous, 171
Bearing, journal, rolling-pad, 131
Bearing, thrust, analysis of hydrodynamic, 31
Bearings, journal, analysis of hpdrodynamic, 63
Bearings, short journal, dynamic loading of, 37
BEHAVIOUR OF CIRCULAR TUBES WITH LARGE OPENINGS SUBJECTED TO AXIAL COMPRESSION, *Paper* 225
BENDING OF LONG STEEL AND ALUMINIUM RODS DURING END IMPACT WITH A RIGID TARGET, *Paper*, 85
Bluff bodies, the prediction of separated flows from, 1
Buffers, hydraulic, dynamic performance of, 221

Cams, planetary, design for short period events, 13
Centrifugal compressor, diffuser/rotor interaction in, 149
Centrifugal compressors, three deimensional flow in, 179
Circular tubes subjected to axial compression, 225
Compressor, centrifugal, diffuser/rotor interaction in, 149
Compressors, centrifugal, three dimensional flow in, 179
Creep, damage in metals due to, 281, 284
Cross-ply laminated strips, bending of, 21
Cumulative creep damage, 281, 284
Curved elastic sheet, unfolding of, 217
Cycle, Stirling, gas dynamics of temperature-determined, 207
CYCLIC SOFTENING AND OVER-SOFTENING OF A 1 PER CENT Cr-Mo-V STEEL AT ELEVATED TEMPERATURE, *Paper*, 305
Cylinder, unyawed ricochet of, 201

Damage in metals due to creep, 281
DESIGN OF PLANETARY CAMS FOR SHORT PERIOD EVENTS, *Paper*, 13
Diesel engines, large bore, gas pressures within ring packs of, 295
Diffuser/rotor interaction in a centrifugal compressor, 149
Diffusion, simulation of viscous, 157
DRAIN DISCHARGE CHARACTERISTICS OF HORIZONTAL DRUMS, *Paper*, 77
Drums, horizontal, drain discharge characteristics, 77
DYNAMIC LOADING OF MICROPOLAR FLUID LUBRICATED SHORT JOURNAL BEARINGS, *Paper* 37
DYNAMIC PERFORMANCE OF HYDRAULIC BUFFERS OF UNEQUAL RATING IN SERIES, *Paper*, 221
Dynamics of a rigid ship, 243

EFFECT OF SLIDING ON ROLLING CONTACT PITTING, *Paper*, 289
EFFECTS OF PROJECTILE SPEED AND MEDIUM RESISTANCE IN RICOCHET OFF SAND, *Paper*, 69
Elastic sheet, unfolding a curved, 217
Electroforming process, theoretical analysis of, 113
ENERGY DISSIPATION IN GYROMECHANICS THROUGH THE CONCEPT OF INTERVALWISE RIGIDITY, *Paper*, 93
ESTIMATE OF THE EFFECT OF BACK SPIN ON THE CRITICAL ANGLE IN THE UNYAWED RICOCHET OF A CYLINDER, *Paper*, 201
Evaluation of multigimbal Hooke's joint gyroscope, 193

Flexible rotors, balancing of during operation, 257
FLOW OF COMPRESSIBLE TWO-PHASE MIXTURES THROUGH SHARP-EDGED ORIFICES, *Research note*, 45
Flow, swirling inlet, annular diffuser performance with, 107

GAS DYNAMICS OF THE TEMPERATURE-DETERMINED STIRLING CYCLE, *Paper*, 207
Gas pressures within the ring packs of large bore diesel engines, 295
Gyromechanics, energy dissipation in, 93
Gyroscope, Hooke's joint, evaluation of, 193

Hooke's joint gyroscope, evaluation of, 193
Horizontal drums, drain discharge characteristics of, 77
Hydraulic buffers, dynamic performance of, 221
Hydrodynamic thrust bearing under unsymmetrical conditions, 31

Inlet flow, annular diffuser performance with, 107
INTERACTION EFFECT CONSIDERATION IN CUMULATIVE DAMAGE IN METALS DUE TO CREEP, *Paper*, 281
Intervalwise rigidity, concept of, energy dissipation in gyromechanics through, 93

Journal bearing, partial porous, analysis of, 171
Journal bearing, rolling-pad, 131
Journal bearings, analysis of hydrodynamic, 63
Journal bearings, short, dynamic loading of, 37

Laminated strips, bending of cross-ply, 21
LARGE DEFLECTION CYLINDRICAL BENDING ANALYSIS OF CROSS-PLY LAMINATED STRIPS, *Paper*, 21
Long steel and aluminium rods, bending of, 85

MASS VELOCITIES UNDER CHOKED FLOW CONDITIONS TWO-PHASE FLASHING PIPE FLOW, *Research note*, 309
Metals, damage due to creep, 281
METHOD FOR PREDICTING ANNULAR DIFFUSER PERFORMANCE WITH SWIRLING INLET FLOW, *Paper*, 107
Micropolar fluids, constitutive equations for, 38
MODIFIED PIVOTAL PLOT FOR CRITICAL LOAD CALCULATION OF A RECTANGULAR PLATE UNDER EDGE COMPRESSION, *Paper*, 167

Nonlinear vibration of a plate, analogue simulation of, 103

Orifices, sharp-edged, flow of compressible two-phase mixtures through, 45

Partial porous journal bearing, analysis of, 171
Pipe flow, flashing, mass velocities under, 309
Piston ring, oil-control, twin-land type, 51
Pitting, effect of sliding on rolling contact, 289
Pivotal points concept, applied to rectangular plate, 167
Planetary cams, design for short period events, 13
Plate, nonlinear vibration of, 103
Plate, rectangular, under edge compression, 167
POROUS RETAINERS FOR ROLLING BEARINGS, *Paper*, 263
PREDICTION OF GAS PRESSURES WITHIN THE RING PACKS OF LARGE BORE DIESEL ENGINES, *Paper*, 295
Prediction of separated flows from bluff bodies, 1
PREDICTION OF STALL TYPE (ABRUPT OR PROGRESSIVE) FOR A SINGLE COMPRESSOR ROTOR, *Paper*, 273
Pressures, gas, 295
Projectile speed and medium resistance in ricochet off sand, 69

Rectangular plate under edge compression, 167
Ricochet, off sand, projectile speed and medium resistance in, 69

Ricochet, unyawed, of a cylinder, 201
Rigid ship, dynamics of, 243
Robot-manipulator, analogue computer simulation of, 121
Rods, bending of long steel and aluminium, 85
ROLLING-PAD JOURNAL BEARING: A PROMISING ANTI-WHIRL CONFIGURATION, *Paper*, 131
Rolling bearings, porous retainers for, 263
Rotor, single compressor: prediction of stall type, 273
Rotors, flexible, balancing during operation, 257

Sand, ricochet off, projectile speed and medium resistance in, 69
Separated flows, the prediction of from bluff bodies, 1
Sharp-edged orifices, flow of compressible two-phase mixtures through, 45
Sheet, unfolding of curved elastic, 217
Ship, rigid, dynamics of, 243
Short journal bearings, dynamic loading of, 37
Short period events, design of planetary cams for, 13
SIMULATION OF VISCOUS DIFFUSION FOR EXTENSION OF THE SURFACE VORTICITY METHOD TO BOUNDARY LAYER AND SEPARATED FLOWS, *Paper* 157
Single compressor rotor, prediction of stall type, 273
Sliding (positive and negative) effect on rolling contact pitting, 289
Spatial four-link mechanisms, velocity fluctuation in, 143
Steel, cyclic softening and over-softening, 305
Stirling cycle, gas dynamics of temperature-determined, 207
Strips, laminated, bending of cross-ply, 21
STUDY OF DIFFUSER/ROTOR INTERACTION IN A CENTRIFUGAL COMPRESSOR, *Paper*, 149
SURFACE VORTICITY MODELLING OF SEPARATED FLOWS FROM TWO-DIMENSIONAL BLUFF BODIES OF ARBITRARY SHAPE, *Paper*, 1
Swirling inlet flow, annular diffuser performance with, 107

Tensioned plate, nonlinear vibration of, 103
THEORETICAL ANALYSIS OF THE ELECTROFORMING PROCESS, *Paper*, 113
THEORETICAL ANALYSIS OF THE TWIN-LAND TYPE OF OIL-CONTROL PISTON RING, *Paper*, 51
THEORETICAL AND EXPERIMENTAL EVALUATION OF THE MULTIGIMBAL HOOKE'S JOINT GYROSCOPE, *Paper*, 193
Three dimensional flow in centrifugal compressors, 179
Thrust bearing, hydrodynamic, under unsymmetrical conditions, 31
Tubes, circular with large openings, 225

UNFOLDING A CURVED ELASTIC SHEET, *Paper*, 217
Unyawed ricochet of a cylinder, 201
USE OF EQUILIBRIUM AXES AND BODY AXES IN THE DYNAMICS OF A RIGID SHIP, *Paper*, 243

VELOCITY FLUCTUATION IN SPATIAL FOUR-LINK MECHANISMS, *Paper*, 143
Viscous diffusion, simulation of, 157
Von Karman vortex street, 165

C 20